

## REMARKS

This is intended as a full and complete response to the Office Action dated September 29, 2005, having a shortened statutory period for response set to expire on December 29, 2005. Please reconsider the claims pending in the application for reasons discussed below.

In the specification, the paragraphs 23, 26, 28, 31-32, 34, 37, 39, 43-44, and 46 have been amended to correct minor editorial problems. Applicant respectfully requests entry of the amended paragraphs and submits that no new matter has been added.

In amended Figure 1, the previously omitted element numeral 111 has been added. In Figures 1 and 2, one occurrence of reference numeral 170b has been amended to 170c. No new matter has been added.

Claims 1-41 remain pending in the application and are shown above. Claims 1-13, 15-38, 40 and 41 stand rejected by the Examiner. Reconsideration of the rejected claims is requested for reasons presented below.

Claim 9 is amended to correct matters of form. Claims 1, 22, 27-30 and 37 are amended to clarify the invention. No new matter has been added.

### **Drawing Objection**

Applicant acknowledges the objection to the drawings where the Examiner asserts that the solenoid coil [102] is not shown being attached to the piston [170']. Applicant respectfully traverses the objection and submits that the feature is shown in Figures 1 and 2, absent amendment. Applicant submits that Figures 1 and 2 are generic and one skilled in the art will realize that the solenoid coil [102] may be attached to magnet [107], which may be attached to the movable shaft [108]. Applicant respectfully requests that the objection to the drawings be withdrawn.

### **Claim Rejections**

Claims 1-5, 11, 12 and 17-21 stand rejected under 35 U.S.C. §102(b) as being anticipated by the patent to *Ohmi, et al.* (U.S. Patent No. 6,193,212). Applicant respectfully traverses the rejection on grounds that the reference *Ohmi, et al.* does not teach or suggest the invention as claimed.

The reference 6,193,212 does not teach, show, or suggest an electronically controlled valve assembly having a valve body having a valve seat, and at least two gas

inlets and one gas outlet below the seat, a piston movable within the valve body above the valve seat between an open position and a closed position, the piston being configured to seal at least one of the at least two gas inlets when the piston is moved to its closed position, a solenoid coil for generating a magnetic field, and a magnetic member, the magnetic member and the solenoid coil moving relatively away from each other when the solenoid coil is electromagnetically induced, such relative movement moving the piston between its open and closed positions, as recited in claim 1. Withdrawal of the rejection to claim 1, and claims dependent thereon, is respectfully requested.

Claims 6-8 and 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,193,212. Applicant respectfully traverses the rejection on grounds that U.S. Patent No. 6,193,212 does not teach or suggest the limitations of claim 1, above. Further, U.S. Patent No. 6,193,212 provides no teaching or motivation for the limitations of claims 6-8 and 15. Withdrawal of the rejection to claims 6-8 and 15, which depend from claim 1, is respectfully requested.

Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable over the U.S. Patent No. 6,193,212, as applied to the claim 11, and further in view of *Yamaji, et al* (U.S. Patent No. 5,295,662). Applicant respectfully traverses the rejection on grounds that U.S. Patent No. 6,193,212 and U.S. Patent No. 5,295,662 alone, or in combination, do not teach the limitations of claim 1, above. Further, U.S. Patent No. 5,295,662 does not teach or provide a suggestion for the limitations of claim 13, which depends from claim 1. Withdrawal of the rejection to claim 13 is respectfully requested.

Claim 16 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,193,212, as applied to claim 2, and further in view of *Ohmi, et al* (U.S. Patent No. 6,289,923). Applicant respectfully traverses the rejection on grounds that U.S. Patent No. 6,193,212 and U.S. Patent No. 6,289,923 alone, or in combination, do not teach the limitations of claim 1, above. Further, Applicant submits that U.S. Patent No. 6,289,923 does not provide a teaching or suggestion for the limitations of claim 16, which depends from claim 1. Withdrawal of the rejection to claim 16 is respectfully requested.

Claims 1-12, 15, 17-37 and 40 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Ohmi, et al* (U.S. Patent No. 6,615,871) in view of U.S. Patent No. 6,193,212 to *Ohmi, et al*. Applicant respectfully traverses the rejection on grounds that U.S. Patent No. 6,615,871 and U.S. Patent No. 6,193,212 alone, or in combination, do not teach or suggest the invention as claimed.

The references 6,615,871 and 6,193,212 alone, or in combination, do not teach, show, or suggest an electronically controlled valve assembly having a valve body having a valve seat, and at least two gas inlets and one gas outlet below the seat, a piston movable within the valve body above the valve seat between an open position and a closed position, the piston being configured to seal at least one of the at least two gas inlets when the piston is moved to its closed position, a solenoid coil for generating a magnetic field, and a magnetic member, the magnetic member and the solenoid coil moving relatively away from each other when the solenoid coil is electromagnetically induced, such relative movement moving the piston between its open and closed positions, as recited in claim 1. Withdrawal of the rejection to claim 1, and claims dependent thereon, is respectfully requested.

Applicant also submits that the references 6,615,871 and 6,193,212 alone, or in combination, do not teach, show, or suggest an electronically controlled valve assembly including a valve body having a valve seat, and a gas inlet and a gas outlet below the seat, the gas inlet being in fluid communication with a reactant source and a purge gas source, and the gas outlet being in fluid communication with a substrate processing chamber, a piston movable within the valve body above the valve seat between an open position and a closed position, a diaphragm disposed at an end of the piston, the diaphragm being configured to seal the at least one gas inlet when the piston is moved to its closed position, a biasing spring acting on the piston and connected diaphragm, a solenoid coil for generating a magnetic field, and a magnetic member, the magnetic member and the solenoid coil moving relatively away from each other when the solenoid coil is electromagnetically induced, such relative movement selectively moving the piston between its open and closed positions, as recited in claim 22. Withdrawal of the rejection to claim 22, and claims dependent thereon, is respectfully requested.

Applicant also submits that the references 6,615,871 and 6,193,212 alone, or in combination, do not teach, show, or suggest a method of injecting a reactant into a substrate processing chamber, including the steps of placing a reactant gas source in fluid communication with an electronically controlled valve assembly, the valve assembly comprising a valve body having a valve seat, a reactant inlet, a purge gas inlet, and a gas outlet, a piston movable within the valve body above the valve seat between an open position and a closed position, the piston being configured to seal the reactant inlet when the piston is moved to its closed position, a solenoid coil for generating a magnetic field, and a magnetic member, the magnetic member and the solenoid coil moving relatively away from each other when the solenoid coil is electromagnetically induced, such relative movement selectively moving the piston between its open and closed positions, and directing a current to the solenoid coil to magnetically induce the coil, causing the piston to move relative to the valve seat, as recited in claim 27. Withdrawal of the rejection to claim 27, and claims dependent thereon, is respectfully requested.

Claim 38 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,615,871 in view of U.S. Patent No. 6,193,212, as applied to claim 37, and further in view of *Yamaji, et al.* (U.S. Patent No. 5,295,662). Applicant respectfully traverses the rejection on grounds that U.S. Patent No. 6,615,871, U.S. Patent No. 6,193,212, and U.S. Patent No. 5,295,662 alone, or in combination, do not teach or suggest the invention of claim 27, above. Further, Applicant submits that U.S. Patent No. 5,295,662 does not provide a teaching or suggestion for the limitations of claim 38, which depends from claim 27. Withdrawal of the rejection to claim 38 is respectfully requested.

Claim 41 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,615,871 in view of U.S. Patent No. 6,193,212, as applied to claim 37, and further in view of U.S. Patent No. 6,289,923. Applicant respectfully traverses the rejection on grounds that U.S. Patent No. 6,615,871, U.S. Patent No. 6,193,212, and U.S. Patent No. 6,615,871 alone, or in combination, do not teach or suggest the invention as claimed in claim 27, above. Further, Applicant submits that U.S. Patent No. 6,289,923 does not provide a teaching or suggestion for the limitations of claim 41,

which depends from claim 27. Withdrawal of the rejection to claim 41 is respectfully requested.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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**IN THE DRAWINGS:**

The attached sheet of drawings includes changes to Figs. 1 and 2. These sheets, which include Figs. 1-2, replaces the original sheets including Figs. 1-2. In Figure 1, previously omitted element 111 has been added and one occurrence of 170b has been changed to 170c, to coincide with the description of the Figure. In Fig. 2, as in Fig. 1, one occurrence of 170b has been amended to 170c. Applicant submits this was a clerical error and that no new matter has been added.

**Attachment:            Replacement Sheet**  
**Annotated Sheet Showing Changes**



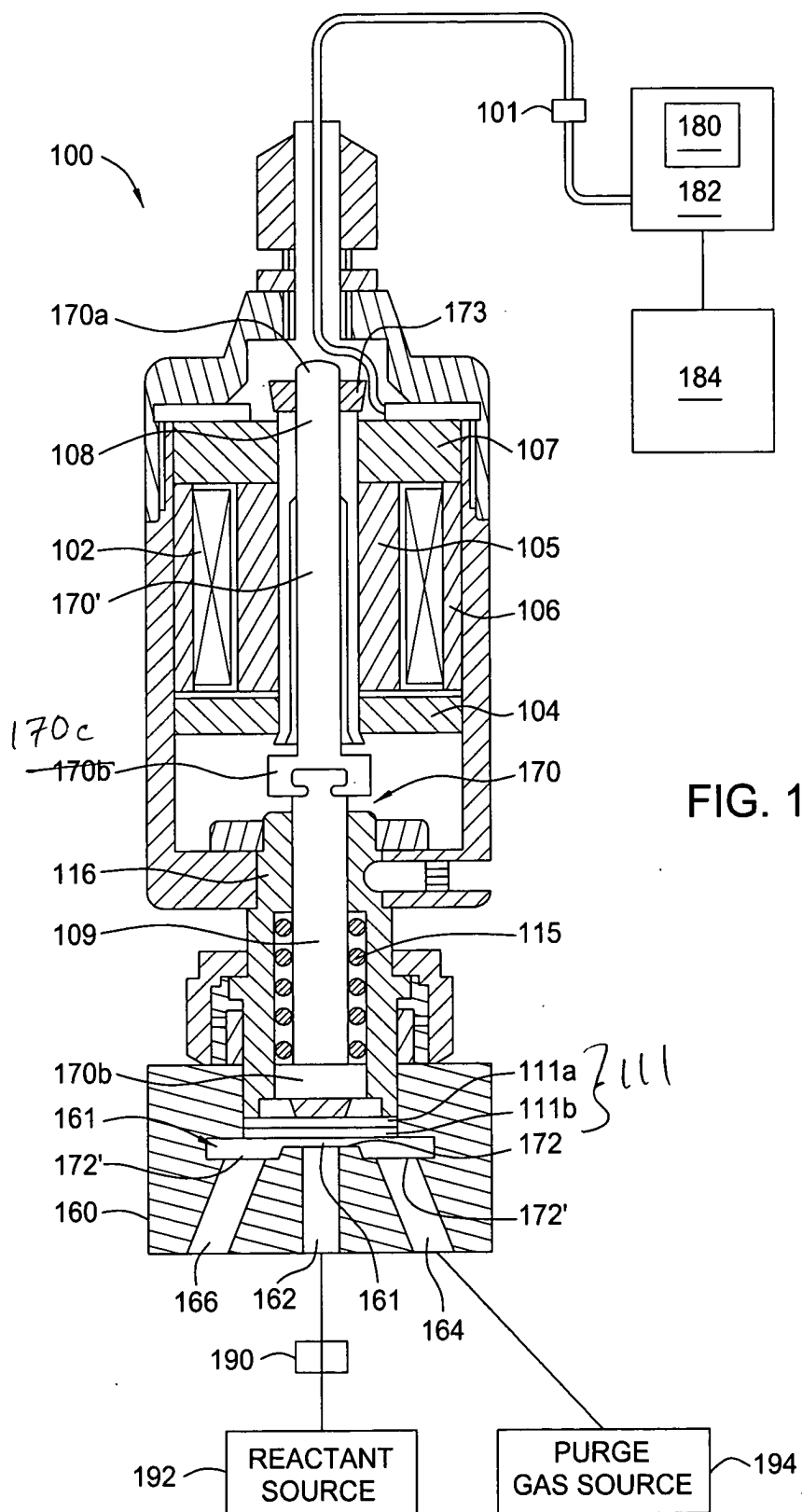
ANNOTATED SHEET SHOWING CHANGES

ATTY DKT. No.: APPM/007874/CPI/ALD/PJS  
U.S. SERIAL No.: 10/644,598  
FILED: AUGUST 20, 2003  
APPLICANT: APPLIED MATERIALS, INC.  
TITLE: ELECTRONICALLY ACTUATED VALVE  
INVENTORS: NGUYEN, ET AL.

CONF. No.: 5564

FIGURE 1

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ATTY DKT. No.: APPM/007874/CPI/ALD/PJS  
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 FILED: AUGUST 20, 2003  
 APPLICANT: APPLIED MATERIALS, INC.  
 TITLE: ELECTRONICALLY ACTUATED VALVE  
 INVENTORS: NGUYEN, ET AL.

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FIGURE 2

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